

# NASA TECHNICAL STANDARDS PROGRAM

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# Program Observations and programme



#### Objectives

- Establish and Maintain "NASA Preferred Technical Standards" As a Common Baseline for NASA Programs
- Develop Internal NASA Standards Where Available Standards Are Not Adequate
- Evaluate, Support, and Adopt National and International Standards Where They Meet
- Support the Use of Technical Standards on NASA Programs in the Systems Requirement Process
- Provide Access for All <nasa.gov> Users to Full Text Standards From >100 Sources at http://standards.nasa.gov
- Linking Standards to Lessons Learned for More Effective Use
- Automated Notice of Updates for Standards Registered by Users

#### **Authority:**

- NPD 8070.6B, "Technical Standards", May 7, 2003
- NASA Preferred Technical Standards Program Plan, April 15, 1999
- Voluntary Consensus Standards And Conformity Assessment Activities" (1998) OMB Circular A-119, "Federal Participation In The Development And Use Of
- NPR 8070.X, Technical Standards Processes (In Development)



# NASA Major and Component Installations

NASA Headquarters, D. Wallops Flight Facility (GSFC) Langley Research Center Marshall Space Flight Center Goddard Space Flight Center Kennedy Space Center Glenn Research Center Johnson Space Center Test Facility (JSC) White Sands Laboratory (NASA Contractor) Ames Research Dryden Flight Research Center Jet Propulsion Center

Michoud Assembly Facility (MSFC)

Stennis Space Center



### NASA Technical Standards Program



(Richard Weinstein - Program Executive) Office of the NASA Chief Engineer (Rex Geveden, Chief Engineer)

Leading Compets

- Program Level Coordination - Functional Standards

- Policy/Oversight/Approval

- Program Sponsorship

Management Board NASA Engineering

(Rex Geveden, Chair)

- Center Approving Authority

Program Issues

(Paul Gill, Chair)

(NTSWG) Group

Standards Working

NASA Technical

- Center Representation - Program Guidance

NASA Technical Standards Program

(Paul Gill, Manager)

- Program Management

- Standards Management System http://standards.nasa.gov

Topic Working

E-(0110)-2

Discipline Technical Warrant Holders - Prioritization of Needs

- Standards Development



### MASA Technical Standards Program FOF BRANCORD STEET



# NASA TECHNICAL STANDARDS PROGRAM

Development of Technical Standards

NASA Technical Standards Voluntary Consensus Standards (VCS) Development

Standards Support and Assessment

Review of NASA Standards (Development and Revision)

Review of VCS for Adoption

NASA Technical Standards System Full-Text
Technical
Standards
System
(NASA Preferred,
Center/Program

Standards Update Notification System (SUNS) Lessons Learned/Application Notes

Program Mgt/ User Support

Program Management/ Integration

Document Management System Program Awareness





Configuration & Documentation Mgmt, Packaging, shipping & Handling, Reproduction & Document Archiving Documentation and Configuration Management, Program Management

Orbital & Celestial mechanics, Aerospace Environments, System Engineering and Integration Systems Engineering and Integration, Aerospace Environments, Celestial Mechanics

Computer Design (Flight & Ground), Software Design (Flight & Ground), Computer & Software Security, Information Computer Systems, Software, Information Systems Systems(ADP) & Network Communications Design

Human Factors and Health Ergonomics, Health Science

Electrical / Electronic Design including Printed Circuit Boards & Electrical Ground & Airborne Support Equipment Electromagnetics and Electrical Discharge Control Guidance & Control, & Optics Electrical Systems, Electronics, Avionics/Control systems, Optics

Structural Design including Stress Corrosion control, Mechanical Design Including Mechanical & Propulsion Ground and Airborne Support Equipment, Propulsion Design, Thermal Design, Flight & Fluid Dynamics Structures/Mechanical systems, Fluid, Thermal. Propulsion, Aerodynamics

Materials &Materials testing including Fluids & Propellants, Material Processes, manufacturing, Parts (Mechanical, Electrical, Materials and Processes, Parts

System and Subsystem testing including Environmental testing. Test Evaluation, Analysis and Modeling System Test, Analysis, Modeling, Evaluation

Safety (Flight, ground, Personnel and Equipment), Quality (Hardware and Software), Reliability (Hardware and Software) Safety, Quality, Reliability, Maintainability Maintainability (Hardware and Software)

Flight and Ground Operations, Mission Command & Control, Telemetry and Data Systems Design, RF Communicatins Design Operations, Command, Control, Telemetry/Data Systems, Communications

Facilities Design, Roads and Grounds Support (Local transportation, fire control, Telephones, Health Care, Etc.) Specifications and Standards for use on Construction Projects (SPECSINTACT)





- Available Standards
- Anything accessible through Technical Standards website
- Preferred Standards
- Recommended by Centers on basis of experience; not "certified"
- Intended as a starting point for selecting project standards; no claim of
- Other Centers must concur they're acceptable for appropriate use
- No major concerns preventing use; specific limitations to be addressed in "Applications Notes"
- Can come from any source (NASA, DoD, Standards Developing Organizations)
- Core Standards
- addressing recurring problems, providing necessary insight and control; not limited to human safety A select list of priority standards considered critical for controlling risk,
- To be addressed by all programs unless waived
- May tailor sub-sets for program types, e.g. robotic spacecraft
- Mandatory Standards
- Those core standards interpreted, tailored, and applied to a specific program or on contracts



### Standards Populos Standards



- Adopted/Pending Adoption Summary
- Total 3,407 (1,774 Performance, 1,633 Acquisition)
- 62 NASA Developed Technical Standards
- 26 Engineering Standards
- 18 IT Standards
- 18 Safety And Mission Assurance
- 2,267 Adopted (Non-NASA) (981 Performance, 1286 Acquisition)
- 1,568 Voluntary Consensus Standards
- 671 Military Specifications and Standards
- 28 Federal and CID Standards
- 1,078 Pending Adoption (Non-NASA) (731 Performance, 347 Acquisition
- 11 AIAA and 61 ISO Performance Standards Sent to NTSWG for Endorsement
- 347 Acquisition and 659 Performance Standards Not Yet Sent Out to NTSWG
- NASA Participation In Non- Gov't Standards Development For FY05 Per OMB Circular A-119
- **30 SDOs**
- 147 Participants
- 197 Standards



### NASA Technical Standards Program



Overview

ASA ACCESS (Registration/Logon)

Standards Products)

Agencywide Full-Text Technical Standards System (Access To NASA Preferred and Other Technical

NASA Participation in Committees and Working Groups

Standards Developing Organizations

Lessons Learned / Best Practices

Standards Update Notification System (SUNS)
 NASA Technical Standards Management System

Feedback

Tutorial

Help

FAQ

Disclaimer

What's New

Standards Gov Website... National Institute of Standards and Technology

The Future of Aerospace Standardization Engineering Lessons Learne And Systems Engineering Applications



Pivacy Statement

### UBLIC ACCESS (Registration/Logon)

- NASA Preferred Technical Standards Products
- Standards Developing Organizations
  - Lessons Leamed / Best Practices

Accessibility Statement

This page modified or 04/29/200

insored By: Office Of The NASA Chief Engineer inderds Executive: Richard Weinstein

ogram Manager. stem Manager. nators:

Paul Gill Brenda Lance Ellen Jones/Kalpana Shiva

## Teancywide Full-text Technical Standards



- Initiated in FY2000: competitive, 5 year, fixed price contract
- Non-Gov't Standards Listings available to public; full text documents to nasa.gov only
- Provides "one stop", transparent access to standards from more than 111 Standards Developing Organizations (SDO's)
- NASA "preferred" technical standards:
- Technical standards developed by NASA
- Adopted standards from other sources
- Center developed standards (JSC, KSC, MSFC, etc.)
- Program documents: Shuttle, Space Station, Payloads
- Other government standards (FAA, Navy, DoD, DoE, etc)
- Extensive metrics: accesses, downloads, documents, requestors...
- Over 280,000 Standards Products downloaded in 4 years



## Standards Update Notification System



- SUNS Allows Users To Register Standards They Use, And Receive Automatic Notification When Standards Are Revised, Re-issued
- Changes To Technical Standards Can Have Major Impacts On The Safety, Performance, Reliability, And Cost Of Programs/Projects
- Using Out-of-Date Standards—Unless Required To Meet Specific Need
- Ignores Improvements And Misses The Benefits Of Experience
- Exposes Programs/Projects To The Risk Of Repeating Those Failures That Led To Update Of The Standard
- For All NASA Programs/Projects To Date:
- 7875 Document Update Requests Received
- 3136 Document Update Notifications Sent





- NASA Lessons Learned System Documents Problems And Improved **Guidance From Program And Project Experience**
- Linking Lessons Learned With Standards Provides Basis For Interpretation/Use And Update Of Standards
- Users Alerted To Lessons Learned At The Time They Search For The Standards
- Current Status
- Over 600 Out Of 1700 Lessons Learned Now Hot-linked To 420 NASA Preferred And Non-government Technical Standards
- Lessons Learned By Technical Discipline And View The Standards "Reverse" Search Capability Permits Users To View Specific Linked To Them
- Now Adding "Application Notes" From Standards Users That Clarify Or Limit The Scope, Use, Or Context Of Standards; Over 170 Linked
- Use Of Lessons Learned System Increasing Throughout The Agency

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	Document Summary Page		
MIL-STD-1686	Revision: C	Status: Active	NASA Status: Preferred
DISS info	No. of NASA Accesses since 06/2001: 118	SDO: MIL	Year Reaffirmed:
LE: ELECTROSTATIC SEMBLIES AND EQUIP 6B)	LE: ELECTROSTATIC DISCHARGE CONTROL PROGRAM FOR PROTECTION OF ELECTRICAL AND ELECTRONIC PARTS, SEMBLIES AND EQUIPMENT (EXCLUDING ELECTRICALLY INITIATED EXPLOSIVE DEVICES) (SUPERSEDING MIL-STD. 6B)	ELECTRONIC PARTS, RSEDING MIL.STD.	Request Standard Update Notification
3ase	Date: 10/25/1995	19 pages	View Dac View TOC
	Document Scone		

#### ase - 10/25/1995|

purpose of this standard is to establish comprehensive requirements for an ESD control program to minimize the effects of ESD on parts, assemblies, and equipment. effective ESD control program will increase reliability and decrease both intenance actions and lifetime costs. This standard shall be tailored for various types of acquisitions.

			Application Notes	Submit Application Note
plicable Project II	) NASA Center	Creation Date		Note
All -	궠	4/26/2001	4/26/2001 Requires that each fac	each facility have a document that describes how they implement ESD controls (for example, see
out-der Taylor o	e chada pojusto di	majiri nghibin nga ma	MSFC-RQMT-2918).	
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	Lessons-Learned and Best-Practices	and Best-Practice	S
LL/BP No.	Title	Date	Relevance to the Standard
:SFC-0032	Assessment and Control of Electrical Charges		This practice references the use of MIL-STD-1686 to establish comprehensive requirements for an ESD control program to minimize the effects of ESD on parts, assemblies, and equipment.
<u>LIS-0151</u>	Throat Plug and Purge Adapter Assembly Grounding	10/8/1992	This lesson addresses a scenario where improperly grounding the throat plug and adapter assembly or a lack of grounding may cause static electricity build-up and electrical sparks which could act as an ignition source for any flammable vapors present.
118-0301	Electrostatic Discharge (ESD) Wrist Strap Contamination of Magellan Flight Hardware	9/15/1993	Electrostatic Discharge (ESD) wrist straps can shed conductive METALLIC fibers into electronic hardware.
S890-SI7	Electrostatic Discharge (ESD) Control in GSE	2/1/1999	The Lesson provides technical recommendations for the control of ESD in aerospace equipment.
LIS-0732	Electrostatic Discharge (ESD) Control in Flight Hardware	2/1/1999	The Lesson addresses the generation of triboelectric and electrostatic charges as a common cause of damage and/ordegradation to unprotected Electrostatic Discharge Sensitive





# Standards Data Base Survey (6732 unique users)

569	1210	325	842	1677	2873	2335 (23.7%)
(5.7%)	(12.3%)	(3.3%)	(8.5%)	(17.0%)	(29.2%)	
Other Use	Education and Training	Evaluation of Proposal(s	Acquisition of Parts or Materials	Verification of a Contractor's Processes on Programs/Projects	In-House R&D (Including Design, Analysis, Testing, Etc.)	Requirements for Program/Project Development



## Permical Standards System A Resource for All Users http://standards.nasa.gov



- The Technical Standards website can be used by <u>a//</u> <nasa.gov> users as a resource to:
- Search for available standards on a subject
  - Download personal copies of standards
- Evaluate/select standards for projects or other uses
- Identify Lessons Learned associated with standards
- Register standards used to get notice of updates (SNNS)
- Submit their advice on use of standards for others
- Submit proposals for development of new standards
- Register information of participants working on non-NASA standards